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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,340	02/06/2006	Hiroyuki Fujimura	285304US0PCT	5321

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EXAMINER	
MILLER, MICHAEL G	

ART UNIT	PAPER NUMBER
1792	

NOTIFICATION DATE	DELIVERY MODE
10/08/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/567,340	FUJIMURA ET AL.	
	Examiner	Art Unit	
	MICHAEL G. MILLER	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *Feb 2006, May 2007, Jun 2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Nishibayashi et al (U.S. Patent 5,132,749, hereinafter '749).

3. Claim 1 – '749 teaches a method of forming a film of a diamond electrode. The method comprises performing a CVD process by supplying a mixed gas comprising a carbon source and hydrogen to form a diamond film on a substrate, wherein performing said CVD process comprises forming, as an outermost surface of the diamond film, a high-quality diamond film having substantially no impurities (Column 7 Lines 5-30).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over '749.

8. Claim 2 – '749 supplies a mixed gas containing carbon and hydrogen in both processes to form the two diamond films, as discussed above. In the first case, the carbon gas is in high concentration relative to the diborane dopant (Column 7 Lines 5-17); in the second case, the carbon gas is in low concentration relative to the hydrogen gas (Column 7 Lines 18-30). '749 is silent as to the rate of formation of the two layers. It is well known in the art of CVD that the rate of deposition is a result-effective variable with regards to the rate of processing; increased deposition rate leads to faster

processing time. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to control the deposition rate of the diamonds films to produce a suitable rate of production of a desired product, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

9. With regards to Claims 3-4, Examiner is interpreting the statements with 'preferably' clauses to include only the broader of the two ranges; the more preferable conditions still satisfy the portions of the claim which are absolutely required. With regards to Claim 3, this means a second concentration of less than 1% was used as the relevant limitation; with regards to Claim 4, this means a first film thickness of not less than 1 micron was used as the relevant limitation.

10. Claim 3 – '749 teaches using a microwave plasma CVD process and using methane as the carbon source in multiple embodiments (Column 6 Line 65 – Column 10 Line 68 generally, Column 6 Line 65 – Column 7 Line 30 and Column 9 Lines 16-58 specifically). The first embodiment cited above teaches a methane concentration of 5.66% for both deposition phases (6 parts methane to 100 parts hydrogen); the second embodiment cited above teaches a methane concentration of 0.99% for both deposition phases (1 part methane to 100 parts hydrogen). Both embodiments produce acceptable diamond films for both deposition phases in the eyes of the prior art. Since the same piece of prior art teaches two separate methods for obtaining two separate sets of diamond films, it would have been obvious to apply the first concentration to the first film and the second concentration to the second film. A person of ordinary skill has

good reason to pursue the known options with his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense.

11. Claim 4 - '749 teaches that the first diamond film has a thickness of 1.0 microns and that the second diamond film has a thickness of 0.1 microns as cited above.

12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over '749 in view of Valone (U.S. Patent 5,602,439, hereinafter '439).

13. Claim 5 – '749 teaches all the limitations of Claim 5 except for deposition on a graphite substrate. '749 further teaches that one product it produces is Schottky diodes (Column 3 Line 65 – Column 4 Line 6). '439 teaches that it is known to deposit diamond films on graphite substrates to produce conductive composite materials, including diodes, using microwave plasma CVD methods (Column 3 Lines 9-58, more specifically Lines 40-58; diodes discussed at Column 5 Lines 36-38). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have combined the method of '749 with the method of '439 because '739 wants to deposit diamond films on substrates for use in diodes and '439 teaches that graphite substrates are known as acceptable substrates for this purpose.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL G. MILLER whose telephone number is (571)270-1861. The examiner can normally be reached on M-F 7-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael G. Miller/
Examiner, Art Unit 1792

/Timothy H Meeks/
Supervisory Patent Examiner, Art Unit 1792